AMENDMENTS TO THE SPECIFICATION

Amend the specification by inserting before the first line the paragraph:

This is a National Stage entry of International Application PCT/JP03/03004, with an international filing date of March 13, 2003, which was published under PCT Article 21(2) in Japanese, and the disclosure of which is incorporated herein by reference. Further, International Application PCT/JP03/03004 is based on Japanese Patent Application Nos. 2002-069077 and 2003-057013, filed in Japan on March 13, 2002 and March 4, 2003, respectively, the disclosures of which are incorporated herein by reference.

Please delete the present Abstract of the Disclosure and replace it with the following new Abstract of the Disclosure.

A dispersion-compensated optical fiber which does not cause an increase in a loss if it is wound in a small reel and has a stable temperature characteristics is provided, wherein, in a wavelength range from . A dispersion-compensated optical fiber is formed such that, in at least a wavelength between 1.53 to 1.63 μm, a bending loss of with a 20 mm bending diameter is 5 dB/m or lower, a wavelength dispersion is -120 ps/nm/km or lower, a cut-off wavelength under a usage condition is 1.53 μm or lower, an outer diameter of the cladding is 80 to 100 μm, an outer diameter of a coating is 160 to 200 μm, and a viscosity of a surface of a coating resin is 10 gf/mm or lower. It is set such that b/a is 1.5 to 3.5, c/b is 1.2 to 2.0, a radius of a core is 4 to 8 μm, Δ1 is +1.6% to +2.6%, Δ2 is -0.30% to -1.4%, and Δ3 is -0.30% to +1.0%. Young's modulus of a first coating layer is 0.15 kgf/mm2 or lower and its thickness is 20 to 30 μm. Young's modulus of a second coating layer is 50 kgf/mm2 or lower and its thickness is 15 to 30 μm.

Please remove the paragraph beginning at page 1, line 14.

Please replace the paragraph beginning at page 6, line 1, with the following, revised, paragraph.

In order to solve the above problems, a first aspect of the present invention is a dispersion-compensated optical fiber in which, in at least a wavelength which is selected from 1.53 μm to 1.63 μm, a bending loss is 5 dB/m or lower when it is ~~would~~ wound by a 20 mm bending diameter, a wavelength dispersion is -120·ps/nm/km or lower, an absolute value of the wavelength dispersion per a unit loss is 200 ps/nm/dB or higher, a cut-off wavelength for used length and used condition is 1.53 μm or lower, an outer diameter of a cladding is 80μm to 100μm, an outer diameter of coating is 160μm to 200μm, and a viscosity of a surface of a coating resin is 10gf/mm or lower.

Please insert before the paragraph beginning at page 10, line 15, the following paragraph.

These and other features, aspects, and advantages of the present invention will become better understood with reference to the following description and accompanying drawings, which should not be read to limit the invention in any way, in which:

Please replace the paragraph beginning at page 10, line 15, with the following, revised, paragraph.

FIGS. 1A, 1B, and ~~to~~ 1C are views for showing an example for refractive index distribution of the dispersion-compensated optical fiber according to the present invention.

Please replace the paragraph beginning at page 10, line 19, with the following, revised, paragraph.

FIG. 3 is a graph for showing a conventional relationship for a transmission speed and an allowable wavelength dispersion.

Please replace the paragraph beginning at page 12, line 1, with the following, revised, paragraph.

In FIGS. 1(a), (b), reference numeral 1a indicates a center core section. Reference numeral 1b indicates an intermediate core section which is disposed on an outer periphery of the center core section 1a. Reference numeral 2 indicates a cladding which is disposed on an outer periphery of the intermediate core section 1b. Also, in FIG. 1(c), reference numeral 1a indicates a center core section. Reference numeral 1b indicates an intermediate core section which is disposed on an outer periphery of the center core section 1a. Reference numeral 1c indicates a ~~cladding~~ ring core section which is disposed on an outer periphery of the intermediate core section 1b. Reference numeral 2 indicates cladding which is disposed on an outer periphery of the ~~intermediate core section 1b~~ring core section 1c.

Please replace the paragraph beginning at page 12, line 12, with the following, revised, paragraph.

In a first example for the dispersion-compensated optical fiber according to the present invention, a ratio b/a of the ~~center~~ radius of the intermediate core section with reference to the radius of the center core section is 1.5 to 3.5, a ratio c/b of the radius of the ring core section with reference to the radius of the intermediate core section is 1.2 to 2.0, a radius of the core is 4 μm to 8μm, a refractive index difference Δ1 of the center core section 1a with reference to the cladding 2 is +1.6 % to +2.6%, a refractive index difference Δ2 of the intermediate core section 1b with reference to the cladding 2 is -0.30% to -1.4%, and a refractive index difference Δ3 of the ring core section 1c with reference to the cladding 2 is ~~-~~±0.30% to +1.0%.

Please replace the paragraph beginning at page 12, line 20, with the following, revised, paragraph.

Also, the dispersion-compensated optical fiber in this example is specified by specific values below in addition to these structures. Such specific values are such that, in at least a wavelength which is selected from 1.53 μm to 1.63 μm, a bending loss is 5 dB/m or lower when it is ~~would~~ wound by a 20 mm bending diameter, a wavelength dispersion is -120·ps/nm/km or lower, an absolute value of the wavelength dispersion per a unit loss is 200 ps/nm/dB or higher, a cut-off wavelength for used length and used condition is 1.53 μm or lower, an outer diameter of a cladding is 80μm to 100μm, an outer diameter of coating is 160μm to 200μm, and a viscosity of

a surface of a coating resin is 10gf/mm or lower, more preferably 1 gf/mm or lower. Here, the wavelength dispersion is in a range in which it is possible to realize approximately -300 ps/nm/km or greater from a view point of a range for controlling a refractive index difference and a bending loss. An absolute value for the wavelength dispersion per a unit loss is in a range in which it is possible to realize approximately 500 ps/nm/dB from a view point of a value of the transmission loss.

Please replace the paragraph beginning at page 14, line 25, with the following, revised, paragraph.

Also, if a module for a dispersion-compensated optical fiber is produced by ~~winging~~ winding a dispersion-compensated optical fiber of which diameter is formed to be small, a temperature characteristics for the module loss is deteriorated because of the surface viscosity. It is possible to realize a module for a dispersion-compensated optical fiber which has a stable temperature characteristics such as a ± 0.5 dB or smaller fluctuation of the module loss in an ordinary temperature range (-5°C to +70°C) by forming the surface viscosity to be 10 gf/mm or smaller, more preferably 1gf/mm or smaller even if a module for a dispersion-compensated optical fiber is produced by winding it on a small coil.

Please replace the paragraph beginning at page 15, line 23, with the following, revised, paragraph.

Also, the dispersion-compensated optical fiber in this example is specified by specific values below in addition to these structures. Such specific values are such that, in at least a wavelength which is selected from 1.53 μm to 1.63 μm, a bending loss is 5 dB/m or lower when it is ~~would~~ wound by a 20 mm bending diameter, a wavelength dispersion is -120·ps/nm/km or lower, an absolute value of the wavelength dispersion per a unit loss is 200 ps/nm/dB or higher, a cut-off wavelength for used length and used condition is 1.53 μm or lower, an outer diameter of a cladding is 80μm to 100μm, an outer diameter of coating is 160μm to 200μm, and a viscosity of a surface of a coating resin is 10gf/mm or lower, more preferably 1 gf/mm or lower.

Please replace the paragraph beginning at page 16, line 25, with the following, revised, paragraph.

A third example for a dispersion-compensated optical fiber according to the present invention is formed such that, in a W-type refractive index profile as shown in FIGS. 1(a), (b), a ratio b/a of a radius of the intermediate core section with reference to the radius of the center core section is 1.5 to 3.5, a radius of the core is 4 μm to 8 μm, a relative refractive index difference Δ1 of the center core section 1a with reference to the cladding 2 is +1.6 % to +2.6 %, a relative refractive index difference Δ2 of the intermediate core section 1b with reference to the cladding 2 is -0.30 % to -1.4 %. A third example for the dispersion-compensated optical fiber according to the present invention is formed such that, in a W-type profile with a ring which is

shown in FIG. 1(c), a ratio b/a of the ~~center~~ radius of the intermediate core section with reference to the radius of the center core section is 1.5 to 3.5, a ratio c/b of the radius of the ring core section with reference to the radius of the intermediate core section is 1.2 to 2.0, a radius of the core is 4 μm to 8μm, a refractive index difference Δ1 of the center core section 1a with reference to the cladding 2 is +1.6 % to +2.6%, a refractive index difference Δ2 of the intermediate core section 1b with reference to the cladding 2 is -0.30% to -1.4%, and a refractive index difference Δ3 of the ring core section 1c with reference to the cladding 2 is +0.30% to +1.0% Also, the dispersion-compensated optical fiber in this example is specified by specific values below in addition to these structures. Such specific values are such that, in at least a wavelength which is selected from 1.53 μm to 57 μm, a bending loss is 5 dB/m or lower when it is ~~would~~ wound by a 20 mm bending diameter, a wavelength dispersion is -120·ps/nm/km or lower, an absolute value of the wavelength dispersion per a unit loss is 200 ps/nm/dB or higher, a cut-off wavelength for used length and used condition is 1.53 μm or lower, a quotient which is obtained by dividing the dispersion slope by the wavelength dispersion is 0.0026 nm^{-1} to 0.010 nm^{-1}, an outer diameter of a cladding is 80μm to 100μm, an outer diameter of coating is 160μm to 200μm.

Please replace the paragraph beginning at page 17, line 29, with the following, revised, paragraph.

A fourth example for a dispersion-compensated optical fiber according to the present invention is formed such that, in a W-type refractive index profile as shown in FIGS. 1(a), (b), a ratio b/a of a radius of the intermediate core section with reference to the radius of the center

core section is 1.5 to 3.5, a radius of the core is 4 μm to 8 μm, a relative refractive index difference Δ1 of the center core section 1a with reference to the cladding 2 is +1.6 % to +2.6 %, a relative refractive index difference Δ2 of the intermediate core section 1b with reference to the cladding 2 is -0.30 % to -1.4 %. Also, a fourth example for the dispersion-compensated optical fiber according to the present invention is formed such that, in a W-type profile with a ring which is shown in FIG. 1(c), a ratio b/a of the ~~center~~ radius of the intermediate core section with reference to the radius of the center core section is 1.5 to 3.5, a ratio c/b of the radius of the ring core section with reference to the radius of the intermediate core section is 1.2 to 2.0, a radius of the core is 4 μm to 8μm, a refractive index difference Δ1 of the center core section 1a with reference to the cladding 2 is +1.6 % to +2.6%, a refractive index difference Δ2 of the intermediate core section 1b with reference to the cladding 2 is -0.30% to -1.4%, and a refractive index difference Δ3 of the ring core section 1c with reference to the cladding 2 is +0.30% to +1.0% Also, the dispersion-compensated optical fiber in this example is specified by specific values below in addition to these structures. Such specific values are such that, in at least a wavelength which is selected from 1.57 μm to 1.63 μm, a bending loss is 5 dB/m or lower when it is ~~would~~ wound by a 20 mm bending diameter, a wavelength dispersion is -120·ps/nm/km or lower, an absolute value of the wavelength dispersion per a unit loss is 200 ps/nm/dB or higher, a cut-off wavelength for used length and used condition is 1.57 μm or lower, a quotient which is obtained by dividing the dispersion slope by the wavelength dispersion is 0.0022 nm^{-1} to 0.010 nm^{-1}, an outer diameter of a cladding is 80μm to 100μm, an outer diameter of coating is 160μm to 200μm.

Please replace the paragraph beginning at page 23, line 7, with the following, revised, paragraph.

Four variations of dispersion-compensated optical fibers with a W-type profile shown in FIG. 1(c) are produced according to a commonly known method such as a VAD method, an MCVD method, or a PCVD method. Under such a condition, values such as ΔÄ1, ΔÄ2, ΔÄ3, b/a, c/b, and a core radius are made so as to be values shown in a TABLE 4 under condition that an atmospheric oxygen density should be 0.1 % or lower (0.0% when it is displayed) when an ultraviolet-ray-curable resin is hardened while being drawn.

Please replace the paragraph beginning at page 27, line 12, with the following, revised, paragraph.

Five variations of dispersion-compensated optical fibers with a W-type profile shown in FIG. 1(b) or with a W-type profile with ring as shown in FIG. 1(c) are produced according to a commonly known method such as a VAD method, an MCVD method, or a PCVD method Under such a condition, values such as ΔÄ1, ΔÄ2, ΔÄ3, b/a, c/b, a core radius, a diameter of the cladding, an outer diameter of a first coating layer, and an outer diameter of a second coating layer are made so as to be values shown in a TABLE 1 under condition that an atmospheric oxygen density should be 0.1 % or lower (0.0% when it is displayed) when an ultraviolet-ray-curable resin is hardened while being drawn.

Please replace the paragraph beginning at page 51, line 6, with the following, revised, paragraph.

Seven variations of dispersion-compensated optical fibers with a W-type profile shown in FIG. 1(b) or with a W-type profile with ring as shown in FIG. 1(c) are produced according to a commonly known method such as a VAD method, an MCVD method, or a PCVD method Under such a condition, they are produced such that values such as $\underline{\Delta}$Ä1, $\underline{\Delta}$Ä2, $\underline{\Delta}$Ä3, b/a, c/b, and a core radius are made so as to be shown in a TABLE 22.

Please insert after the paragraph beginning at page 55, line 7, the following paragraph.

Although the above exemplary embodiments of the present invention have been described, it will be understood by those skilled in the art that the present invention should not be limited to the described exemplary embodiments, but that various changes and modifications can be made within the spirit and scope of the present invention.